UNITED STATES PATENT AND TRADEMARK OFFICE

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10/645,952	08/22/2003	Xiao-Fan Feng	SLA1222	8258

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EXAMINER
KAU, STEVEN Y

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>06 January 2009</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-22</u> is/are pending in the application.

    4a) Of the above claim(s) <u>1-13 and 19</u> is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>14-18 and 20-22</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>17 February 2004</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's amendment was received on 1/6/2009, and has been entered and made of record. Currently, claims 14-8, and 20-22 are pending for further examination in this Action.

Response to Remark/Arguments

2.   Applicant's arguments with respect to claims 14-8, and 20-22 have been fully considered and the reply to the Remarks/Arguments is in the following:

- Applicant's arguments, "Claim 22 has been rejected Under 35 U.S.C. § 112, first paragraph", page 11-12, Remarks, 1/6/2009, with respect to claim 22 have been fully considered and are persuasive. The examiner considers that Fig. 9 of the disclosure provide steps or algorithm, which "It is understood by those skilled-in-the-art that methods are implemented by computer means and that a list of method steps or elements is sufficient to enable the use of a computer program implementing those steps or elements". Thus, claim 22 rejection under 35 USC 112 first paragraph is withdrawn from the record.

- Applicant's argument, "Claim 22 is rejected under 35 USC § 101 because the claimed invention is directed to non-statutory subject matter. Claim 22 is amended to more clearly show that the instructions are encoded in a

computer program and are, therefore, statutory subject matter.", page 12,

Remarks, 6/25/2008, is **NOT** persuasive and the examiner withdrawn the

statement, "Claim 22 has been amended to satisfy the statutory

requirements of 35 U.S.C. § 101. The rejection of claim 22 under USC 101

has been withdrawn from the record", pages 2-3, Office Action, 10/6/2008.

The reason for maintaining claim 22 rejection under 35 USC 101 rejection

is given in the following rejection section.

22 under 35 U.S.C. § 101 has been withdrawn from the record

- Applicant's arguments, "Claim 22 has been objected", page 11, Remarks,

  1/6/2009, are persuasive. Claim 22 has been amended. Thus the

  objection to claim 22 is withdrawn from the record.

- Applicant's arguments, "Claim 21 has been rejected under 35 USC 112,

  second paragraph", page 12, Remarks, 1/6/2009 are fully considered and

  persuasive. Thus, claim 21 rejection under 35 USC 112, second

  paragraph is withdrawn from the record.

- Applicant's arguments filed on March 26, 2007 have been fully considered

  but are moot in view of the new ground(s) of rejection.

- Applicant's arguments with respect to Claims 14-18 and 21-22 have been

  fully considered but are not persuasive. The arguments offered by

  Applicant with regard to the rejected claims have been addressed

  sufficiently in the Examiner's previous actions and the Examiner's position

  remains unchanged.

With respect to clams 14, 16, 17, 21 and 22, applicant's arguments, "The rejection is improper as it fails to present a prima facie case of obviousness. Daly does not disclose a method for creating a dither pattern in which dither pattern pixel values are dispersed from values in other color channel or image description channels. Daly shows, in conjunction with Figures 3-5, that different dither pattern tiles may be used for each color channel, but does not disclose a method whereby the dither patterns in the tiles are created with feedback related to pixel values in the dither patterns of other color channels" and "designating pixel values in said dither pattern tiles wherein subsequently-designated pixel values are spatially dispersed from previously-designated pixel values in the same dither pattern tile and *dither pattern tiles in other color channels.*" Emphasis added. Daly does not disclose this element wherein pixel values in the dither pattern tiles are designated by spatial dispersion from pixel values in other color channels.", page 13, Remarks.

In re, the Examiner respectfully disagrees the argument that the element of "this element wherein pixel values in the dither pattern tiles are designated by spatial dispersion from pixel values in other color channels". As applicant admitted that "Daly shows, in conjunction with Figures 3-5, that different dither pattern tiles may be used for each color channel", page 13, Remarks. In addition, Daly discloses, "Some embodiments include setting the 3D array to the exact size as will be used in the application, and performing the filtering via FFT (fast Fourier Transforms) without

padding, so that wraparound characteristics of the digital filtering do not cause boundary discontinuities such as going from the last frame to the starting frame) in the spectral statistics", (Paragraph 50) and "To extend this noise to color applications, one embodiment generates two independent spatiotemporal arrays. These are applied to opponent color signals, and transformed via a matrix from having an achromatic, and two chromatic signals (such as L*, A*, and B*, or Y, U, and V) into a 3-channel RGB signal.", (Paragraph 53). These are the prima facie facts that Daly does teach and suggest the claim element of "*dither pattern tiles in other color channels*" and a method whereby the dither patterns in the tiles are created with feedback related to pixel values in the dither patterns of other color channels due to "that wraparound characteristics of the digital filtering do not cause boundary discontinuities such as going from the last frame to the starting frame) in the spectral statistics".

Thus, the examiner maintains the same ground rejection as stated in the previous office action and the same ground of rejection is still valid and stands.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4.   Claims 14-18, 20 and 22 are rejected under 35 U.S.C. 101 as not falling within

one of the four statutory categories of invention. Supreme Court precedent[1] and recent

Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must

(1) be tied to another statutory category (such as a particular apparatus), or (2)

transform underlying subject matter (such as an article or material) to a different state or

thing.

Claim 14 is directed to a method claim for crating a spatio-temporal array of

dither pattern. While the instant claim recites a series of steps or acts to be performed,

the claim neither transform underlying subject matter nor positively tie to another

statutory category that accomplishes the claimed method steps, and therefore do not

qualify as a statutory process. For example, claim 14, recites, "A method for creating a

spatio-temporal array of dither patterns, said method comprising: a. establishing a

spatio-temporal array of dither pattern tiles comprising a plurality of temporal framesets,

each of said framesets comprising a plurality of pattern tiles for each of a plurality of

color channels; and b. designating pixel values in said dither pattern tiles wherein

subsequently- designated pixel values are spatially dispersed from previously-

designated pixel values in the same dither pattern tile and dither pattern tiles in other

color channels." The applicant has not provided explicit and deliberate definitions of

steps of "establishing", and "designating" which are (1) be tied to another statutory

category (such as a particular apparatus), or (2) transform underlying subject matter

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

(such as an article or material) to a different state or thing, to limit the steps of establishing a spatio-temporal array of dither pattern tiles, and designating pixel value. The method for creating a spatio-temporal array of dither patterns include steps of establishing temporal frameset and designating pixel value can just be interpreted as a mental process steps or an algorithm type of thinking. It does not meet any one of 35 U.S.C. statutory categories of "process, machine, manufacture, or composition of matter". Thus, claim 14 is rejected under 101. Claims 15-18 are rejected under 35 USC 101 due to their dependency to claim 14.

Claim 20 is directed to a method for creating a spatio-temporal array of dither patterns. While the instant claim recites a series of steps or acts to be performed, the claim neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, claim 20, limitations recite, "a. establishing an initial temporal offset frameset (ITOF), wherein said ITOF comprises a pre-determined pattern for each of a plurality of color channels; b. establishing a first temporal frameset comprising dither pattern tiles for each of a plurality of color channels; c. designating a first pixel value at a first point in a first dither pattern tile of said first temporal frameset, wherein said first point is dispersed from at least one pixel value in said pre-determined pattern; d. designating a second pixel value at a second point in said first dither pattern tile of said first temporal frameset, wherein said second point is placed at a location that is dispersed away from at least one pixel value in said first dither pattern tile; e.

repeating step d until all pixel values in said first dither pattern tile of said first temporal frameset have been designated; f. designating a first pixel value at a first point in a second dither pattern tile of said first temporal frame, wherein said first point is dispersed from at least one pixel value in said first dither pattern tile; g. designating a second pixel value at a second point in said second dither pattern tile of said first temporal frameset, wherein said second point is placed at a location that is dispersed away from at least one other pixel value in said first dither pattern tile; h. repeating step g until all pixel values in said second dither pattern tile have been designated; i. repeating steps f, g & h until all pixels in all dither pattern tiles in said first temporal frameset have been designated; j. establishing a subsequent temporal frameset comprising dither pattern tiles for each of said plurality of color channels; k. designating a first pixel value at a first point in a first dither pattern tile of said subsequent temporal frameset, wherein said first point is dispersed from at least one pixel value in said first temporal frameset; l. designating a second pixel value at a second point in said first dither pattern tile of said subsequent temporal frameset, wherein said second point is placed at a location that is dispersed away from at least one pixel value in said subsequent temporal frameset, at least one pixel value in at least one prior frameset; m. repeating step 1 until all pixel values in said first dither pattern tile of said subsequent temporal frameset have been designated; n. designating a first pixel value at a first point in a second dither pattern tile of said subsequent temporal frame, wherein said first point is dispersed from at least one pixel value in said subsequent temporal frameset, at least one pixel value in a prior frameset; o. designating a second pixel value at a second

point in said second dither pattern tile of said subsequent temporal frameset, wherein said second point is placed at a location that is dispersed away from at least one pixel value in said subsequent temporal frameset, at least one pixel value in a prior temporal frameset; p. repeating step o until all pixel values in said second dither pattern tile have been designated; q. repeating steps n, o & p until all pixels in all dither pattern tiles in said subsequent temporal frameset have been designated; r. repeating steps j-q for a plurality of framesets." The applicant has not provided explicit and deliberate definitions of steps of "establishing", "designating" and "repeating", which are (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing, to limit the steps of establishing an initial and a first temporal offset frameset comprising a pre-determined pattern for each of a plurality of color channels or dither pattern tiles for each of a plurality of color channels, and designating a first and second pixel value. The method for creating a spatio-temporal array of dither patterns include steps of establishing temporal frameset and designating pixel value can just be interpreted as a mental process steps or an algorithm type of thinking. It does not meet any one of 35 U.S.C. statutory categories of "process, machine, manufacture, or composition of matter". Thus, claim 20 is rejected under 101.

Claim 22 is directed to a computer-readable medium comprising computer-executable instructions encoded in a computer program for creating a spatio-temporal array of dither patterns. However, the "computer-readable medium" is not defined in the specification at all. Without disclosing "computer-readable medium", the examiner

cannot interpret applicant's claim in light of the disclosure. Thus, the examiner will give

a broadest interpretation to "computer-readable medium". According to the field of the

art, "computer-readable medium" can be a signal which can carry programming

data/information transmitting in a network. For example, a user can download a printer

driver from a server in a network to his or her computer, or a user can send a command

to a networked printer for printing a print job. A signal is not a "process", not a "machine"

nor "composite material" as stated in 35 U.S.C. 101 statutory categories. That is, a

signal does not meet the 35 U.S.C. 101 statutory requirements. Thus, claim 22 is

rejected under 35 U.S.C. 101.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

6.   Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the written description requirement. The claim contains subject matter which was

not described in the specification in such a way as to reasonably convey to one skilled

in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention. With respect to claim 21, limitation recites, "a

designating computing device for designating pixel values in said dither pattern tiles

wherein said designating computing device designates subsequently-designated pixel

values that are spatially dispersed from previously-designated pixel values in the same

dither pattern tile and dither pattern tiles in other color channels" (emphasis added by

applicant). The underlined element is a new matter introduced by amendment, which is

not disclosed in the original specification.

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8.   Claims 14, 15, 18, 21 and 22 are rejected under 35 U.S.C. 102(e) as being

anticipated by Daly (US 2003/0164961).

Regarding claim 14.

Daly' 961 discloses a method for creating a spatio-temporal array of dither

patterns (**i.e. creating pseudo-random noise from human visual system and**

quantization, Par. 26 and Fig. 8, Para. 35), said method comprising:

a. establishing a spatio-temporal array of dither pattern tiles comprising a plurality of

temporal framesets (**Fig. 8 discloses spatio-temporal array of dither pattern tiles**

comprising multiple temporal framesets, Para. 58), each of said framesets

comprising a plurality of pattern tiles for each of a plurality of color channels (**Figs. 4**

and 5, discloses color channels for said framesets, Paras. 40-54); and

b. designating pixel values (**e.g. such frames 0-n in Frameset P each designating**

pixel values, Figs. 5 and 8) in said dither pattern tiles wherein subsequently-

designated pixel values are spatially dispersed from previously-designated pixel values

in the same dither pattern tile and dither pattern tiles in other color channels (**dither**

patterns are repeated continuously across the image, either horizontally or

vertically, and the final noise profile is combined with color channels image data,

Figs. 5 and 8, Paras. 55-63).

Regarding claim 15, in accordance with claim 14.

Daly' 961 discloses that subsequently-designated pixel values are also dispersed

from previously-designated pixel values in other temporal frames (**dither patterns are**

repeated continuously across the image, either horizontally or vertically, thus

subsequently-designated pixel values are also dispersed from previously-

designated pixel values in other temporal frames, Figs. 5 and 8, Paras. 55-63).

Regarding claim 18, in accordance with claim 15.

Daly' 961 discloses pixel values designated in a last temporal frame are

considered temporally adjacent to a first-designated frame wherein said pixel values in

said first-designated frame have a dispersion effect on pixels designated in said last

frame (**Fig. 8 discloses a embodiment that the last frame is temporally adjacent to**

the first frame and pixel values in said first-designated frame have a dispersion

effect on pixels designated in said last frame because dither patterns are

repeated continuously across the image, either horizontally or vertically, Figs. 5

and 8, Paras. 55-63).

Regarding claim 21.

Daly' 961 discloses system for creating a spatio-temporal array of dither patterns, said

system (**System of Fig. 5**) comprising:

a. a spatio-temporal array of dither pattern tiles comprising a plurality of temporal

framesets (**Fig. 8 discloses spatio-temporal array of dither pattern tiles comprising**

multiple temporal framesets, Para. 58), each of said framesets comprising a plurality

of pattern tiles for each of a plurality of color channels (**Figs. 4 and 5, discloses color**

channels for said framesets, Paras. 40-54); and

b. a designating computing device (**e.g. visual system of Figs 3-5**) for designating

pixel values (**e.g. such frames 0-n in Frameset P each designating pixel values,**

Figs. 5 and 8) in said dither pattern tiles wherein said designating computing device

designates subsequently-designated pixel values are spatially dispersed from

previously-designated pixel values in the same dither pattern tile and dither pattern tiles

in other color channels (**dither patterns are repeated continuously across the**

image, either horizontally or vertically, and the final noise profile is combined

with color channels image data, Figs. 5 and 8, Paras. 55-63).

Regarding claim 22.

Claim 22 recites identical features as claim 14, except claim 22 is a computer-

readable medium claim. Thus, arguments similar to that presented above for claim 14

are also equally applicable to claim 22.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.   Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daly

(US 2003/0164961) as applied to claim 15, and in view of Lippel (US 4,758,893).

Regarding claim 16, in accordance with claim 15.

Daly' 961 does not explicitly disclose that other temporal frames are weighted.

Lippel' 893 discloses wherein said dispersion from pixel values in other temporal

frames is weighted wherein temporal frames more temporally distant from a pixel value

have a lower dispersion than closer temporal frames (e.g. **Lippel discloses weighted**

temporal frames for subcycling cinematic dither and therefore, temporal instant

of temporal frames can be controlled, col 10, lines 13-24).

Having a method of Daly' 961 reference and then given the well-established

teaching of Lippel' 893 reference, it would have been obvious to one having ordinary

skill in the art at the time the invention was made to modify the method of Daly' 961

reference to include data conversion as taught by Lippel' 893 reference since doing so

would be able to control priority of color channels in the method for creating a spatio-

temporal array of the dither patterns and further the services provided could easily be

established for one another with predictable results.

11.   Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daly

(US 2003/0164961) as applied to claim 15, and in view of Masuji et al (US 7,110,010).

Regarding claim 17, in accordance with claim 15.

Daly' 961 does not explicitly disclose that dispersion from pixel values in other

color channels is weighted wherein other color channels have a lower dispersion than

the color channel in which a pixel value is designated.

Masuji' 010 teaches that dispersion from pixel values in other color channels is

weighted wherein other color channels have a lower dispersion than the color channel

in which a pixel value is designated (**Masuji' 010 discloses that dither coefficient is**

weighted with color gradation level and dither coefficient is selected for dithering

process, col 4, lines 23-39 and col 14, lines 17-33, and Fig. 17).

Having a method of Daly' 961 reference and then given the well-established

teaching of Masuji' 010   reference, it would have been obvious to one having ordinary

skill in the art at the time the invention was made to modify the method of Daly' 961

reference to include data conversion as taught by Masuji' 010 reference since doing so

would enhance the method for creating a spatio-temporal array of the dither patterns by

selecting different weight level of dither coefficient to optimize dither coefficient patterns

and further the services provided could easily be established for one another with

predictable results.

Conclusion/David K Moore/

Supervisory Patent Examiner, Art Unit 2625

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Steven Kau whose telephone number is 571-270-1120

and fax number is 571-270-2120. The examiner can normally be reached on M-F,

8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Moore can be reached on 571-272-7437. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

/Steven Kau/
Examiner, Art Unit 2625
3/18/2009

/David K Moore/
Supervisory Patent Examiner, Art Unit 2625